



- 1) BuLi (1.6 eq), DME, $-78\text{ }^{\circ}\text{C}$, 1.5 h
then TEMPO (1.26 eq), $\text{Cp}_2\text{Fe}^+\text{PF}_6^-$, $-40\text{ }^{\circ}\text{C}$, 10 min
then $100\text{ }^{\circ}\text{C}$, 1.5 h, 87%
- 2) *B*-bromocatecholborane (1.3 eq), CH_2Cl_2 , $-30\text{ }^{\circ}\text{C}$, 1 h
then aq. NaOH, 96%
- 3) DIBALH (3.8 eq), toluene, rt, 5 h, 79%

- 4) NaH (1.7 eq), THF, $0\text{ }^{\circ}\text{C}$, 1 h
then MeI (3.0 eq), $0\text{ }^{\circ}\text{C}$ to rt, 20 h, 80%
- 5) rose bengal (5 mol%), O_2 , hv, iPr_2NEt (2.0 eq),
 CH_2Cl_2 , $-78\text{ }^{\circ}\text{C}$, 6 h, 85%
- 6) (+)-CSA (1.1 eq), MeOH, reflux, 20 h, 75%

